REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1-14 and 28-33 are pending, of which claims 1-14 and 28 have been amended. Support for the amendments can be found at least at pages 5-10 and Figs. 1-4 of the Application as filed.

Applicant's amendments and remarks after Final are appropriate under 37 C.F.R. §1.116 because they address the Office's remarks in the Final Action and could not have been presented earlier. In addition, the amendments and remarks should be entered to place the case in better form for appeal.

35 U.S.C. §103 Claim Rejections

A. Claims 1-2, 4, 11-12, 28-29 and 31 are rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,636,929 to Frantz et al. (*hereinafter*, "Franzt") in view of an IBM Technical Disclosure entitled "Multiple Control Unit/Device Emulator for Testing Computer Programs" (*hereinafter*, "IBM Technical") (*Office Action* pp. 15, 17-18, 30, and 33). Applicant respectfully traverses the rejection.

B. Claims 3, 5, and 9-10 are rejected under 35 U.S.C. §103(a) as being obvious over Frantz and IBM Technical in view of a document "Universal Serial Bus (USB) Device Class Definition for Human Interface Devices (HID), Version 1.11, June 21, 2001)" (*hereinafter*, "UsbHid"), and further in view of a document

"Universal Serial Bus Specification, Rev. 1.1, September 23, 1998" (*hereinafter*, "UsbSpecs") (*Office Action* p.19). Applicant respectfully traverses the rejection.

C. Claims 6-7 and 30 are rejected under 35 U.S.C. §103(a) as being obvious over Frantz and IBM Technical in view of a document entitled "Code Complete, A Practical Handbook of Software Construction" by Steven McConnell (*hereinafter,* "McConnell") (*Office Action* pp. 22 and 34). Applicant respectfully traverses the rejection.

D. Claim 8 is rejected under 35 U.S.C. §103(a) as being obvious over Frantz and IBM Technical in view of UsbSpecs, and further in view of a document entitled "Computer Networks Third Edition" by Tanenbaum (*hereinafter*, "Tanenbaum") (*Office Action* p.26). Applicant respectfully traverses the rejection.

E. Claims 13-14 and 32-33 are rejected under 35 U.S.C. §103(a) as being obvious over Frantz and IBM Technical in view of Tanenbaum (*Office Action* pp. 28 and 36). Applicant respectfully traverses the rejection.

Claim 1 recites an interface device for testing an in-test host's support of USB peripherals, the interface device comprising:

> one or more USB interfaces configured to communicate with one or more USB ports of the in-test host to communicate USB messages with the in-test host;
>
> a network interface configured to communicate with a peripheral emulator using a network communications protocol;
>
> operating logic configured to perform actions comprising:
>
> receiving USB command messages sent from the in-test host to the interface device;
>
> sending the received USB command messages from the interface device to the peripheral emulator through the network interface using the network communications protocol;
>
> receiving USB response messages sent from the peripheral emulator to the interface device through the network interface using the network communications protocol;
>
> sending the received USB response messages from the interface device through the one or more USB interfaces to the in-test host.

Frantz and/or IBM Technical do not teach or suggest the combination of features recited in claim 1. For example, Frantz and/or IBM Technical do not teach or suggest an interface device including a network interface configured to communicate with a peripheral emulator using a network communications protocol, as recited in claim 1.

Frantz describes a system for controlling a personal computer or server (*i.e.,* the managed computer) using a management console that is remotely located from the managed computer (*Frantz,* col.1, lines 34-37). A user at the management console will use the actual peripheral devices located at the remote management console to interact with the remote management console, and send data to a management subsystem (*Frantz,* col.3 line 65 to col.4 line 47; col.7 lines 45-52).

The management subsystem of Frantz is connected to the managed computer via a USB bus (*Frantz,* col.11, lines 22-27). More specifically, the management subsystem can be provided integrally on the system board of the managed computer, or it can be provided as a plug-in board which connects to the system bus of the managed computer. A USB device emulator is located on the management subsystem, and mimics the operation of the peripherals available at the remote management console (*Frantz,* col.12, line 65 to col.13, line 15). In short, the emulator of Frantz is located at the managed computer. As such, Frantz does not teach or suggest an interface device including a network interface that is configured to communicate with a peripheral emulator using a network communications protocol, as recited in claim 1.

IBM Technical describes a micro-program "for converting a small central processing unit into a device for emulating multiple input/output devices and associated control units" (*IBM Technical*, lines 1-2). According to IBM Technical, "such an emulation capability allows the emulator to be attached to a

central processing system for testing the system itself, and for testing computer programs for the system without the necessity of physically attaching the input/output devices and employing people to operate those devices," and "provides the capability for testing programs which drive currently unavailable devices." (*IBM Technical*, lines 1-7). However, IBM Technical fails to cure the deficiencies of Frantz, as it does not teach or suggest and interface device that includes "a network interface configured to communicate with a peripheral emulator using a network communications protocol", as recited in claim 1.

Frantz and/or IBM Technical also do not teach or suggest an interface device for testing an in-test host's support of USB peripherals which includes operating logic configured to perform the actions recited in claim 1. More specifically, Frantz and/or IBM Technical do not teach or suggest an interface device for testing an in-test host's support of USB peripherals which includes operating logic configured to perform actions comprising:

(a) receiving USB command messages sent from the in-test host to the interface device;

(b) sending the received USB command messages from the interface device to the peripheral emulator through the network interface using the network communications protocol;

(c) receiving USB response messages sent from the peripheral emulator to the interface device through the network interface using the network communications protocol;

(d) sending the received USB response messages from the interface device through the one or more USB interfaces to the in-test host , as recited in claim 1 (*Emphasis Added*).

As noted above, Frantz describes a system for controlling a personal computer or server (i.e., the managed computer) using a management console that is remotely located from the managed computer (*Frantz*, col.1, lines 34-37). A user at the management console will use the actual peripheral devices located at the remote management console to interact with the remote management console, and send data to the management subsystem (*Frantz*, col.3, line 65 to col.4, line 47; col.7 lines 45-52).

The management subsystem of Frantz is connected to the managed computer via a USB bus (*Frantz,* col.11, lines 22-27). More specifically, the management subsystem can be provided integrally on the system board of the managed computer, or it can be provided as a plug-in board which connects to the system bus of the managed computer. A USB device emulator is located on the management subsystem, and mimics the operation of the peripherals available at the remote management console (*Frantz,* col.12, line 65 to col.13, line 15). In short, the USB emulator of Frantz is located at the managed computer.

As such, Frantz does not teach or suggest receiving USB command messages sent from an in-test host to an interface device, and then sending the received USB command messages from the interface device to the peripheral

emulator through the network interface using the network communications protocol, as recited in claim 1. Instead, Frantz describes that the USB device emulator is part of the management subsystem which is located at the managed computer (*Frantz,* col.11, lines 5-9).

Since the emulator described in Frantz is a USB device emulator which is located at the management subsystem, Frantz clearly does not disclose or suggest "sending the received USB command messages from the interface device to the peripheral emulator through the network interface using the network communications protocol", as recited in claim 1. Even if one were to consider the management subsystem of Frantz to be the "interface device" of claim 1, Frantz does not disclose or suggest the other recited features.

As noted previously, IBM Technical describes a micro-program "for converting a small central processing unit into a device for emulating multiple input/output devices and associated control units" (*IBM Technical*, lines 1-7). However, IBM Technical fails to cure the deficiencies of Frantz, as it does not teach or suggest receiving USB command messages sent from an in-test host to the interface device, and then sending the received USB command messages from the interface device to the peripheral emulator through the network interface using the network communications protocol, as recited in claim 1.

Still further, Frantz does not teach or suggest operating logic configured to perform actions including "receiving USB response messages sent from the peripheral emulator to the interface device through the network interface using the

network communications protocol" and then "sending the received USB response messages from the interface device through the one or more USB interfaces to the in-test host", as recited in claim 1.

Instead, as described previously, Frantz describes that the USB device emulator is located in the management subsystem which is located at the managed computer (*Frantz,* col.11, lines 5-9; col.12, line 65 to col.13, line 15). Once again, since the emulator described by Frantz is the USB device emulator which is located in the management subsystem at the managed computer, Frantz clearly cannot teach or suggest receiving USB response messages sent from the peripheral emulator to the interface device through the network interface using the network communications protocol, and then sending the received USB response messages from the interface device through the one or more USB interfaces to the in-test host, as recited in claim 1. Even if one were to consider the management subsystem of Frantz to be the "interface device" of claim 1, Frantz does not disclose or suggest the other recited features.

Accordingly, claim 1 is allowable over the Frantz, IBM Technical combination for at least the several reasons described above, and Applicant respectfully requests that the §103 rejection be withdrawn.

Claims 2-14 are allowable by virtue of their dependency upon claim 1, and are allowable over Frantz and/or IBM Technical for the reasons described above in the response to the rejection of claim 1. Additionally, any one of claims 2, 4, and

11-12 may be allowable over the Frantz, IBM Technical combination for independent reasons. Accordingly, the §103 rejection should be withdrawn.

Claims 3, 5, and 9-10 are also allowable over the Frantz, IBM Technical, UsbHid, and UsbSpecs combination because UsbHid and UsbSpecs do not address the deficiencies of the Frantz, IBM Technical combination as described above in response to the rejection of claim 1. Accordingly, the §103 rejection should be withdrawn.

Claims 6-7 are also allowable over the Frantz, IBM Technical, and McConnell combination because McConnell does not address the deficiencies of the Frantz, IBM Technical combination as described above in response to the rejection of claim 1. Accordingly, the §103 rejection should be withdrawn.

Claim 8 is also allowable over the Frantz, IBM Technical, UsbSpecs, and Tanenbaum combination because UsbSpecs and Tanenbaum do not address the deficiencies of the Frantz, IBM Technical combination as described above in response to the rejection of claim 1. Accordingly, the §103 rejection should be withdrawn.

Claims 13-14 are also allowable over the Frantz, IBM Technical, and Tanenbaum combination because Tanenbaum does not address the deficiencies of the Frantz, IBM Technical combination as described above in response to the rejection of claim 1. Accordingly, the §103 rejection should be withdrawn.

Claim 28 recites a method of testing an in-test host's support of USB peripherals, the method comprising:

> receiving USB command messages sent from the in-test host at an interface device;
>
> packaging the received USB command messages in command data packets formatted in accordance with a network communications protocol;
>
> sending the command data packets from the interface device to one or more peripheral emulators over network communications media;
>
> receiving response data packets sent from the one or more peripheral emulators over the network communications media at the interface device, wherein the response data packets are formatted in accordance with a network communications protocol;
>
> unpackaging USB response messages from the received response data packets;
>
> sending the unpackaged, USB response messages from the interface device to the in-test host.

As described above in response to the rejection of claim 1, Frantz and/or IBM Technical do not teach or suggest the combination of features recited in claim 28. For example, Frantz does not teach or suggest receiving USB command messages sent from the in-test host to an interface device, packaging the received USB command messages in command data packets formatted in accordance with a network communications protocol, and then sending the command data packets from the interface device to one or more peripheral emulators over network communications media. Rather, Frantz describes that a USB device emulator is located in a management subsystem which is located at a managed computer. The

emulator mimics peripheral devices which are connected to a remote management console, thereby allowing a user at the remote management console to use the actual peripheral devices to transfer data to the managed computer (*Frantz,* col.3, line 65 to col.4, line 47; col.7 lines 45-52).

Since the emulator described by Frantz is a USB device emulator which is located at the management subsystem, Frantz clearly cannot teach or suggest "sending the command data packets from the interface device to one or more peripheral emulators over network communications media", as recited in claim 28. Even if one were to consider the management subsystem of Frantz to be the "interface device" of claim 28, Frantz does not teach or suggest the other recited features. For example, Frantz does not describe sending command data packets from the management subsystem to one or more peripheral emulators over network communications media, since the USB emulator of Frantz is located at the management subsystem.

As noted previously, IBM Technical describes a micro-program "for converting a small central processing unit into a device for emulating multiple input/output devices and associated control units" (*IBM Technical*, lines 1-7). However, IBM Technical fails to cure the deficiencies of Frantz, as it does not teach or suggest receiving USB command messages sent from the in-test host to an interface device, packaging the received USB command messages in command data packets formatted in accordance with a network communications protocol, and then sending the command data packets from the interface device to one or more peripheral emulators over network communications media, as recited in claim 28.

Still further, Frantz and/or IBM Technical also do not teach or suggest "receiving response data packets sent from the one or more peripheral emulators over the network communications media to the interface device, wherein the response data packets are formatted in accordance with a network communications protocol", "unpackaging USB response messages from the received response data packets" and then "sending the unpackaged, USB response messages from the interface device to the in-test host" as recited in claim 28.

Rather, Frantz describes that the USB device emulator is located in the management subsystem at the managed computer. Once again, since the emulator described by Frantz is the USB device emulator which is located at the management subsystem, Frantz clearly cannot teach or suggest receiving response data packets sent from the one or more peripheral emulators over the network communication media to the interface device, as recited in claim 28.

Accordingly, claim 28 is allowable over the Frantz, IBM Technical combination for at least the several reasons described above, and Applicant respectfully request that the §103 rejection be withdrawn.

Claims 29-33 are allowable by virtue of their dependency upon claim 28, and are allowable over Frantz and/or IBM Technical for the reasons described above in the response to the rejection of claim 28. Additionally, any one of claims 29 and 31 may be allowable over the Frantz, IBM Technical combination for independent reasons. Accordingly, the §103 rejection should be withdrawn.

Claim 30 is also allowable over the Frantz, IBM Technical, and McConnell combination because McConnell does not address the deficiencies of the Frantz,

IBM Technical combination as described above in response to the rejection of claim 28. Accordingly, the §103 rejection should be withdrawn.

Claims 32-33 are also allowable over the Frantz, IBM Technical, and Tanenbaum combination because Tanenbaum does not address the deficiencies of the Frantz, IBM Technical combination as described above in response to the rejection of claim 28. Accordingly, the §103 rejection should be withdrawn.

No Motivation or Suggestion to Combine the References

The Office is reminded that if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification (MPEP § 2143.01). As discussed below, modifying the system of Frantz as proposed by the Office would render the system unsatisfactory for its intended purpose. Accordingly, it would not have been obvious to modify Frantz in view of IBM Technical, as set forth in the Office Action.

Once again, Frantz is directed to controlling a personal computer or server (*i.e.*, managed computer) using a management console that is remotely located from the managed computer (*Frantz*, col.1 lines 34-37). Thus a user at the management console will use the actual peripheral devices located at the remote management console to interact with the remote management console, and send data to the management subsystem.

The Office asserts that it would have been obvious to modify the system of Frantz in view of the teachings of IBM Technical, apparently by replacing the

management console and attached peripheral devices with an emulator (which is configured to emulate various peripheral devices).

Applicant respectfully disagrees. Clearly, there can be no motivation to replace the management console and associated peripheral devices described in Frantz with an emulator, since Frantz relies on using these peripheral devices to control the managed computer. Therefore, making the modification proposed by the Office would render the invention of Frantz unsatisfactory for its intended purpose. Thus, one of ordinary skill in the art would not have been motivated to modify the system of Frantz in such a manner.

In addition, if the Office is suggesting that the USB device emulator of Frantz be relocated from its position at the management sub-system to a position at the remote management console, such a relocation would also render the invention of Frantz unsatisfactory for its intended purpose. If such a relocation was implemented, and in order for the peripheral emulator to be used for testing an in-test host's support of emulated peripherals, the test system would still need an interface device, as recited in Applicant's claims.

All of the pending claims are rejected over the combination of Frantz and IBM Technical (with some of the claims being rejected over one or more additional references). For the reasons discussed above, the combination relied on throughout the Office Action is improper. Applicant respectfully requests reconsideration of the cited combination, and withdrawal of all the §103 rejections that include the Frantz, IBM Technical combination.

Conclusion

Pending claims 1-14 and 28-33 are in condition for allowance. Applicant respectfully requests reconsideration and issuance of the subject application. If any issues remain that preclude issuance of this application, the Examiner is urged to contact the undersigned attorney before issuing a subsequent action.

Respectfully Submitted,

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